**CLAIMS**

1. A multi-layered blown film forming apparatus comprising:

an adapter provided to supply a multiple types of molten resins;

a forming die provided on a downstream side in an axial direction of said adapter; and

a temperature controller mechanism,

wherein said molten resins of the multiple types are individually fed to said forming die through said adapter,

said forming die comprises:

a main body;

a multi-layer structure of a plurality of single-layer thin film dies disposed in an inner portion of said main body in said axial direction to produce a plurality of thin resin films corresponding to said molten resins of the multiple types; and

a first annular path formed between said main body and said multi-layer structure,

a multi-layered thin film in which said plurality of thin resin films are laminated passes through said first annular path and is outputted as a multi-layered thin annular film, and

said temperature controller mechanism individually controls temperatures of said plurality of single-layer thin film forming dies.

2. The multi-layered blown film forming apparatus according to claim 1, wherein said temperature controller mechanism comprise:

a plurality of cartridge heaters provided to pierce said multi-layer structure;

at least one temperature sensor provided in each of said plurality of single layer thin film forming dies of said multi-layer structure; and

a controller circuit configured to individually drive said plurality of cartridge heaters based on temperatures set for said plurality of single layer thin film forming dies and temperatures detected by said temperature sensors such that one of said plurality of single layer thin film forming dies is individually heated by a corresponding one of said plurality of cartridge heaters.

3. The multi-layered blown film forming apparatus according to claim 2, wherein said temperature controller mechanism further comprises:

a cooling air feeding tube provided to pierce said multi-layer structure, and to discharges cooling air for cooling said plurality of single layer thin film forming dies, and

said controller circuit controls an amount of said cooling air fed to said cooling air feeding tube.

4. The multi-layered blown film forming apparatus according to claim 2, wherein each of said plurality of single layer thin film forming dies comprises an upstream-side single layer forming die and a downstream-side single layer forming die,

an annular cooling air path is formed between said upstream-side single layer forming die and said downstream-side single layer forming die, and

said cooling air from said cooling air feeding tube flows through said annular cooling air path, to cool said upstream-side single layer forming die and said downstream-side single layer forming die.

5. The multi-layered blown film forming apparatus according to any of claims 1 to 4, further comprising:

a lip main body provided in a bottom portion of said forming die to have a lip portion which has a second annular path connected to said first annular path such that said multi-layered thin film is outputted,

said temperature controller mechanism further comprises:

an air reserving section provided between said lip main body and said multi-layer structure;

a bubble air feeding tube provided to pass through said multi-layer structure to said air

reserving section and to feed bubble air to said air reserving section; and

an air nozzle configured to pass through said lip portion to said air reserving section and to discharges said bubble air present in said air reserving section to an inner portion of said multi-layered thin film outputted from said second annular path, and

said controller circuit controls an amount of said bubble air fed to said air reserving section through said bubble air feeding tube.

6. The multi-layered blown film forming apparatus according to claim 5, wherein said temperature control mechanism further comprises:

a band heater provided on an outer circumferential surface of at least one of said lip main body and said forming die, and

said control circuit drives said band heater to heat said bubble air in said air reserving section.

7. The multi-layered blown film forming apparatus according to any of claims 1 to 6, further comprising:

a cooling mechanism provided on a downstream side of said forming die to cool said multi-layered thin annular film.

8. The multi-layered blown film forming apparatus according to claim 7, wherein said cooling mechanism comprises:

a first cooling mechanism configured to air-cool said multi-layered thin annular film by using cooling airflow;

a second cooling mechanism provided on a downstream side of said first cooling mechanism and configured to cool said multi-layered thin annular film by using an annular cooling water flow; and

a third cooling mechanism provided on a downstream of said second cooling mechanism and configured to cool said multi-layered thin annular film by using cooling water spray.

9. The multi-layered blown film forming apparatus according to claim 8, wherein said cooling mechanism further comprises:

a first radiation thermometer configured to measure a temperature of said multi-layered thin annular film outputted from said forming die in non-contact, and

said first cooling mechanism controls a flow rate of said cooling airflow based on the measured temperature by said first radiation thermometer.

10. The multi-layered blown film forming

apparatus according to claim 8 or 9, wherein said first cooling mechanism comprises:

an air feeding duct for feeding said cooling airflow to an annular air blow outlet to air-cool said multi-layered thin annular film by using said cooling airflow outputted from said annular air blow outlet;

an airflow rate adjusting unit interposed in said air feeding duct to adjust said cooling airflow rate; and

an air cooling heat exchanger unit interposed in said air feeding tube to cool said cooling airflow.

11. The multi-layered blown film forming apparatus according to any of claims 8 to 10, wherein said cooling mechanism further comprises:

a second radiation thermometer configured to measure a temperature of said multi-layered thin annular film outputted from said first cooling mechanism in non-contact, and

said second cooling mechanism controls a flow rate of said annular cooling water flow based on the measured temperature by said second radiation thermometer.

12. The multi-layered blown film forming apparatus according to any of claims 8 to 11, wherein said second cooling mechanism comprises:

a first cooling water feeding tube configured to feed first cooling water;

a first water flow rate adjusting unit interposed in said first cooling water feeding tube to adjust an flow rate of the first cooling water;

a first cooling water heat exchanger unit interposed in said first cooling water feeding tube to cool said first cooling water; and

a water reservoir unit configured to store said first cooling water, and

said water reservoir unit comprises a weir provided to an inner-side upper periphery of said water reservoir unit such that said first cooling water overflows as said annular cooling water flow, a height of said weir being adjustable from a water level of said first cooling water.

13. The multi-layered blown film forming apparatus according to any of claims 8 to 12, wherein said cooling mechanism further comprises:

a dewatering unit configured to remove water attached to said multi-layered thin annular film outputted from said second cooling mechanism, and

a distance between said second cooling mechanism and said dewatering unit is adjustable.

14. The multi-layered blown film forming

apparatus according to any of claims 8 to 13, wherein said third cooling mechanism comprises:

a plurality of sprays provided to a circumference of said multi-layered thin annular film to spray second cooling water;

a second cooling water feeding tube configured to feed said second cooling water to said plurality of sprays;

a second cooling water flow amount adjustment unit interposed in said second cooling water feeding tube to adjust a flow rate of said second cooling water; and

a second cooling water heat exchanger unit interposed in said second cooling water feeding tube to cool said second cooling water.

15. The multi-layered blown film forming apparatus according to claim 1, wherein said plurality of single layer thin film forming dies have a same size,

each of said plurality of single layer thin film forming dies comprise:

a truncated conical upstream-side single layer forming die having a truncated conical portion; and

a truncated conical downstream-side single layer forming die connected to said upstream-side

single layer forming die on a downstream side,

each of said upstream-side single layer forming die and said downstream-side single layer forming die each has a recess portion in a bottom portion, and said downstream-side single layer forming die engages said recess portion of said upstream-side single layer forming die,

said upstream-side single layer forming die receives a corresponding one of said molten resins of the multiple types, and feeds said corresponding molten resin to said downstream-side single layer forming die, and

said downstream-side single layer forming die comprises a radial resin path and a spiral resin path formed to a side face of said truncated conical portion and connected to said radial resin path, and outputs said corresponding molten resin fed from said upstream-side single layer forming die to said first annular path through said radial resin path and said spiral resin path.

16. A multi-layered blown film forming method comprising:

independently controlling temperatures of a plurality of single layer thin film forming dies, wherein a forming die comprises a main body, a multi-layer structure of said plurality of single layer thin

film dies disposed in an inner portion of said main body in an axial direction;

individually feeding molten resins of multiple types to said plurality of single layer thin film forming dies through an adapter;

producing a plurality of thin resin films corresponding to said molten resins of the multiple types by said plurality of single layer thin film forming dies; and

outputting, as a multi-layered thin annular film, a multi-layered thin film of said plurality of thin resin films from said plurality of single layer thin film forming dies are overlaid, through a first annular path formed between said main body and said multi-layer structure.

17. The multi-layered blown film forming method according to claim 16, wherein said controlling comprises:

comparing a temperature set for each of said plurality of single layer thin film forming dies and a temperature detected by at least one temperature sensor provided in said single layer thin film forming die; and

driving said plurality of cartridge heaters independently based on a result of the comparison such that said single layer thin film forming die is

individually heated by a corresponding one of a plurality of cartridge heaters provided to pierce said multi-layer structure.

18. The multi-layered blown film forming method according to claim 16, wherein said controlling comprises:

controlling a flow rate of cooling air fed to a cooling air feeding tube which is provided to pierce said multi-layer structure such that cooling air is discharged for cooling said plurality of single layer thin film forming dies.

19. The multi-layered blown film forming method according to claim 16, wherein each of said plurality of single layer thin film forming dies comprise an upstream-side single layer forming die and a downstream-side single layer forming die,

an annular cooling air path is formed between said upstream-side single layer forming die and said downstream-side single layer forming die,

said controlling further comprise:

cooling said upstream-side single layer forming die and said downstream-side single layer forming die with cooling air fed from said cooling air feeding tube and flowing through said annular cooling air path.

20. The multi-layered blown film forming method according to any of claims 16 to 19, wherein a lip main body is provided in a bottom portion of said forming die, and has a lip portion having a second annular path connected to said first annular path such that said multi-layered thin film is outputted,

said controlling comprises:

feeding bubble air to an air reserving section through a bubble air feeding tube provided to pierce said multi-layer structure, to said air reserving section provided between said lip main body and said multi-layer structure;

controlling a flow rate of said bubble air fed to said air reserving section through said bubble air feeding tube; and

discharging said bubble air present in said air reserving section to an inner portion of said multi-layered thin film outputted from said second annular path through an air nozzle which pierces said lip portion to said air reserving section.

21. The multi-layered blown film forming method according to any of claims 16 to 20, further comprising:

cooling said multi-layered thin annual film on a downstream side of said forming die.

22. The multi-layered blown film forming method according to claim 21, wherein said cooling step comprises:

carrying out first cooling to air-cool said multi-layered thin annular film by using annular cooling air in a first cooling mechanism;

carrying out second cooling to cool said multi-layered thin annular film by using an annular cooling water flow in a second cooling mechanism on a downstream side of said first cooling mechanism;

carrying out third cooling to cool said multi-layered thin annular film by using cooling water spray in a third cooling mechanism on a downstream side of said second cooling mechanism.

23. The multi-layered blown film forming method according to claim 22, wherein said carrying out first cooling comprises:

measuring a temperature of said multi-layered thin annular film; and

controlling a flow rate of said annual cooling airflow based on the measured temperature of said multi-layered thin annular film in a first cooling mechanism.

24. The multi-layered blown film forming method according to claim 23, wherein said carrying out

second cooling comprises:

controlling a flow rate of said annular cooling water flow based on the measured temperature of said multi-layered thin annular film.

25. The multi-layered blown film forming method according to any of claim 22 to 24, wherein said carrying out first cooling comprises:

feeding a cooling airflow to said annular air blow outlet to air-cool said multi-layered thin annular film by using said annual cooling air fed from said annular air blow outlet;

adjusting an flow rate of said cooling airflow in a midway of said air feeding tube; and

cooling said cooling airflow in a midway of said air feeding tube.

26. The multi-layered blown film forming method according to any of claim 22 to 25, wherein said carrying out second cooling comprises:

feeding first cooling water through a first cooling water feeding tube;

adjusting a flow rate of said first cooling water in a midway of said first cooling water feeding tube;

cooling the first cooling water in a midway of said first cooling water feeding tube;

storing said first cooling water in a reservoir unit; and

cooling said multi-layered thin annular film by using said annular cooling water flow overflowing over a weir from said reservoir unit.

27. The multi-layered blown film forming method according to any of claim 22 to 26, wherein said cooling mechanism further comprises:

a dewatering unit configured to remove water attached to said multi-layered thin annular film outputted from a second cooling mechanism, and

said carrying out second cooling comprises:

adjusting a distance between said second cooling mechanism and said dewatering unit based on a desired property of said multi-layered thin annular film.

28. The multi-layered blown film forming method according to any of claims 22 to 27, wherein said carrying out third cooling comprises:

cooling said multi-layered thin annular film by spraying second cooling water to a circumference of said multi-layered thin annular film from a plurality of sprays;

feeding said second cooling water to said plurality of sprays through a second cooling water

feeding tube;

adjusting a flow rate of said second cooling water in a midway of said second cooling water feeding tube; and

cooling said second cooling water in a midway of said second cooling water feeding tube.